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II. *An Account of an Experiment made before the Royal Society at Gresham College, together with a Repetition of the same, touching the Production of a Considerable Light upon a slight Attrition of the Hands on a Glass Globe Exhausted of its Air: With other Remarkable Occurrences. By Mr Fra. Hauksbee, F. R. S.*

HAVING had the Favour of making several Experiments, in Relation to the Production of Light from Sundry Bodies, and in Different Manners, before this Honourable Society, which they were pleas'd to Countenance, by their Approbation and Publication of them, as being in some respect or other, Different from any heretofore made on the same subject: Which, with the Hopes I had still of Advancing some farther Discoveries; And that I thought my Endeavours of this kind would not be altogether unacceptable to the Society, Together with the Nobleness of the Subject concurring, prompted me with all willingness to prosecute the same.

The Experiments already made on this head, As the Attrition of Amber on Woollen, Glass on Glass, and with several other Bodies *in vacuo*, which tho' afforded but a weak Light, yet the Manner of making them seem'd to open a way to farther Improvements, which, during the late Interval of Meeting, I pursu'd with my utmost diligence. The Result of the many Experiments made on this occasion are compriz'd in a very few, which shall be repeated before this Honourable Society, as Opportunity shall give leave.

One of that small number I had the Honour to make before the Society, who were pleas'd to order a Repetition of the same next meeting, which accordingly was done, with some little Additions ; and in obedience to their Commands to give an Account of it, which, so far as occur'd to Memory, according to my slender Capacity for such a task, accept as follows. I took a Glass Globe about 9 inches diameter, and having exhausted the Air from within it, it was taken from the Pump ; but first a Cock was turn'd, which prevented the Air from re-entering it. Thus secur'd, and fixt for to give it Motion by the Great Wheel, describ'd in *Phil. Transf.* Numb. 304. which when turn'd gave a swift motion to the Globe, on whose surface was apply'd my open and naked Hands, which in a very little time produc'd a considerable Light. And still as I mov'd my Hands from one place to another, that the Humid *Effluvia* (which very readily condenses on Glass) might be discharg'd from every part of it ; so did the Light improve, till Words in Capital Letters were legible by it, as was observ'd the last time by a Gentleman then present. At another time, when I have made the Experiment, the Light produc'd has been so great, that a Large Print without much difficulty might be read by it : And at the same time, altho in a pretty large Room, the whole became sensibly Illuminated ; the Wall at the farthest distance (which was at least 10 foot) was visible. The Light appear'd of a curious Purple colour, and was produc'd by a very slight and tender touch of the Hands, the Globe Glass at the same time being hardly sensibly warm. Nor do I find a more immoderate Attrition to advance the Light any thing. Nor is the high st degree of Rarification of the Air in the Globe, absolutely necessary in the production of this Light ; for it seem'd to continue very little lessen'd in its colour or vigour, till (I believe) more than a fourth part of its Air was let in. I have often observ'd the same, as to the Light produc'd

duc'd in the Mercurial Experiments, ( but not as to Colour ) for in those Experiments it was always pale: And there being such a seeming Congruity of Appearances in all the Circumstances of them, with those made on the Attrition of Glass without it, that one might with some probability conclude, that the Light produc'd proceeds from a Quality in the Glass, upon such a Friction or Motion given it; and not from the Mercury, any other ways than as a proper Body, which falling or rubbing on the Glass, produces the Light. And that which would seem farther to Corroborate such a Conclusion is, That some time ago I took a Mercurial Barometer, and rubb'd the upper or Deserted part of the Tube between my Fingers, and a Light ensu'd, without the motion of the Quicksilver. Yet for all this the Conclusion is doubtful, and there may be such a Quality as Light in Mercury, as well as in Glass or any other body, since an Experiment lately made on purpose seems to contend for it, and is as follows. I took a small quantity of Quicksilver, and put it into a Galleypot, wherein Varnish often had been used, and by that means it had got a pretty thick Lining of it; the Weather was at that time moist ( which I purposefully mention, because the humidity in the Air, would sometimes render the Experiment unsuccessful even in Glass, or at least mightily impair the appearance of it, ) which had an influence on the Varnish, as something to soften it. However, the success of the Experiment was, That when the Galleypot with its contain'd Mercury came to be *in Vacuo*, upon shaking the Pump a Light did appear, and this without the Concurrence of Glass, or the favour of a more proper Season to assist it. Moreover, I am inform'd by several Persons of credit, that the Medicine call'd *Mercurius Dulcis*, when broken in the dark, gives notable Flashes of Light; but the Mercury in the Medicine being pointed with Salts, each little Globule of it is enveloped with the same, that I cannot be assur'd the Salts do not

contribute to the *Phænomenon*, since I have often observ'd that Loaf Sugar, when struck or broke in the dark, affords a Light, and I cannot tell but Salts as closely united in their parts as the prementioned Sugar, may give a Light upon a violent separation of them, till I have made some Tryals, in relation (as near as I can) to a true discovery of it: (Which I design with the first opportunity.) The first will be to try whether the Medicine when broken *in Vacuo* will afford any Light, which I think I may expect if it proceeds from the Mercury, since if there be any such Quality in that body, it seems to be the most proper *Medium* to discover it in. Secondly, what the Salts will do without Quicksilver, both in the open Air and *in Vacuo*; for there are some Bodies that appear light in the dark in the open Air, which altogether lose that shining Quality *in Vacuo*. As for instance, I took a piece of Wood, (which I suppose had lain under ground a considerable time,) it was very moist, but not rotten, and appear'd very vividly of the Colour of Fire in the dark: Having included it under a Receiver on my Pump, I found as the Air was taken from it, so did the Fire-like Appearance of it decay, till at last *in Vacuo* it became perfectly void of Light; and as the Air was let in again, so by degrees it recover'd its pristine Appearance. This I repeated several times with the like success. Now begging pardon for this long digression, I proceed to the latter part of the Experiment. After the Attrition of the exhausted Globe was continu'd for some time, the prementioned Cock was return'd, which gave liberty for the Air to insinuate into the Globe through the joyns of the Screws; the motion of the great Wheel and the application of the Hands continuing all the while: And as the Air fill'd the Globe, so the mode of Light continu'd to alter, till the like quantity of Air had re-enter'd as was taken from it; then became as great a difference of Light from what was produc'd when evacuated of Air,

Air, as when the Experiment was made with Quicksilver-*Vacuo* and in the open Air. Certain Specks of Light were then seen upon the Fingers that toucht the Globe, but without any great Lustre, and it was very remarkable that while my hand continued upon the Glass, and the Glass in motion, if any person approach'd his Fingers towards any part of the Glass in the same Horizontal Plain with my Hand, within an inch or thereabouts, a Light would appear to stick to the Fingers, notwithstanding they did not touch the Glass, as was confirm'd by several then present. And my Neckcloth at the same time, at an inch or 2, distant from it, appear'd of the colour of Fire, without any communication of Light from the Globe. Thus much for the latter part of the first Tryal. The former part of both being alike, save only that upon application of white Sheeps Leather in the latter, a very good Light was produc'd, during it was held to the Globe with the Wool side next it; but when the same piece of Leather was turn'd with its other side to the Globe, no Light did ensue, although continued for some time; but so soon as it was chang'd again, the Light would appear as at first, and so upon several Repetitions the same. As to the latter part of this Tryal, the Air was not let in all at once as before, but at several times, whereby the Modes of Light produc'd in the different *Mediums*, were the better observable, although no very great Alteration happen'd either to its Colour or Vigour, till so considerable a quantity, as more than a quarter part of the Globes natural content of Air was let in; but sometimes before half the Air was suffer'd to re-enter (as near as I could guess) it was not without some pleasure to behold, how the Light began to break in Branches from that side the Globe touch'd by the hands, filling the whole body of it with very odd Figures, and these Branches of Light, at the entrance of more Air, were become in more slender Stems, striking then against the opposite side of the Glass, and thence reverberating again

in a very pleasing manner; but after more and more Air was let in, so the Light and Figures diminish'd, till the Appearance became the same as related in Tryal the first.

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III. *A Letter from Mr Samuel Dale to Dr Hans Sloane, R.S. Secr. giving an Account of what Manuscripts were left by Mr John Ray, together with some Anatomical Observations made at Padua by the said Mr Ray.*

**H**Erewith you will receive divers *Anatomical Observations*, that were made at *Padua*, by our late learned and most ingenious Friend the Reverend Mr *John Ray*, upon the dissection of some Humane Bodies, by that great Anatomist *Seignior Antonio Marchetti*, and do contain, besides those things which Mr *Ray* did himself remarks, divers Observations of the Operators which did not occur in those Bodies, to some of which Mr *Ray* hath added Notes. To these are subjoyned two Dissections of Mr *Ray's*, viz. of a *Hare*, and the *Mountain Hen*, neither of which can I find published in his Works, nor hath he taken any notice of these Observations in his *Book of Travels*, altho the Charge was very considerable, amounting to 284 *Livres* and 15 *Soldi* of *Venice*.

Besides these, there are in his *Adversaria* many *Observations*, *Inscriptions*, *Epitaphs*, *Antiquities*. &c. which being collected together, would make a large *Supplement* to his *Observations* already published.

Nor must I forget his *Travels* in our own and the neighbouring Kingdom, of which he hath left divers *Itineraries*: These may not be unuseful to our *English Travellers*,